REMARKS

Entry of the above amendment and reconsideration of the rejections based on the amendment and the following remarks are respectfully requested.

The Examiner has rejected Claims 1-10, 14 and 22 under 35 U.S.C. § 103(a) as being unpatentable over U.S. 5,440,300 (Spillman, Jr.) in view of Japanese Patent No. 8-233845 (Tokyo Gas Co.). This rejection is respectfully traversed. Claim 1 has been amended to more clearly recite the invention of a tomographic sensor array which is suitable for monitoring conditions within a vessel that are remote from the sensor array. Such tomographic systems utilize a distributed set of sensors from which sample data produces a set of "projections" through the contents of the vessel being monitored. These projections are then processed to form an estimate of one or more conditions through the cross-section of the vessel contents. The tomographic sensor array of the present invention thus monitors the conditions of the contents within the vessel at locations remote from the location of the sensor array itself, either by measuring a property between sensors within the array, e.g., the electrical resistance between one sensor and another sensor, or by a single sensor transmitting and subsequently receiving back a signal through the vessel contents. By using an array of such sensors, it is possible to build an estimate of the conditions within a two or three dimensional slice through the vessel contents.

There is no disclosure or suggestion of this type of array in either Spillman, Jr. or Tokyo Gas Co. There is no motivation provided by either reference to one skilled in the art to

attempt to combine the teachings of these references. Neither reference indicates any problem with the method of operation that it describes, and each relates to different fields of sensor operation. Spillman, Jr. describes structures having sensors fixedly embedded within a material for detecting or measuring changes in the material itself, which necessarily requires some means to obtain an output from within the material. The disclosure of Tokyo Gas Co. measures surface conditions of a body through the use of a sheet-shaped sensor. In that disclosure, the sensor is directly electrically connected to the evaluating circuitry. There is nothing in Spillman, Jr. to suggest the use of a flat sensor substrate, since Spillman, Jr. is only concerned with embedding sensors in a solid material. Similarly, there is nothing disclosed in the Tokyo Gas Co. reference to suggest the need for transmitting and receiving a sensor output signal through the wall of a vessel without having access to a direct electrical connection.

Moreover, neither Spillman, Jr. nor Tokyo Gas Co. anticipate the features of the present invention, which relate to a tomographic sensor array. As described above, a tomographic sensor array can monitor conditions of a material remote from the sensor array. Both Spillman, Jr. and Tokyo Gas Co. describe arrangements that monitor conditions directly adjacent to the sensors. For example, Tokyo Gas Co. relates to the monitoring of temperature or air flow directly over the sensors. Spillman, Jr. relates to the measurement of physical data from within a solid body. Neither Spillman, Jr. nor Tokyo Gas Co. teaches or suggests the use of a tomographic sensor array suitable for monitoring conditions remote from the sensor array.

In view of the foregoing amendment and remarks, Applicant believes that the Examiner's rejection of Claim 1 has been overcome and Claim 1 is now believed to be allowable. Claims 2-10, and 14, each dependent upon Claim 1, are also now believed to be allowable by virtue of Claim 1 being allowable. Furthermore, the Examiner's rejections of Claims 15-17 and 21 under 35 U.S.C. § 102(b) and Claims 18-20 under 35 U.S.C. § 103(a) are obviated by Applicant's cancellation of those claims.

Applicant has added Claims 23-25 to further clarify the possible operational modes of the sensor arrays embodying the invention. Claims 26 through 29 have been added to further describe aspects of the present invention. Specifically, these claims recite that the substrate carrying the sensor array is selectably disposed within the interior of the vessel, and that the selection of the position of the substrate is determined based on one or more physical characteristics of the vessel. None of the cited references disclose or suggest that the position of the sensor array within the vessel can be selected or chosen based on some characteristic of the vessel, such as, for example, to avoid interference with physical structures, e.g. stirrers, located within the vessel. Selectable placement of the sensor array substrate is also necessary in order to permit retrofitting of existing vessels, which may have different designs, shapes, and mechanical parts, with the monitoring apparatus of the present invention. The problems associated with retrofitting, addressed by aspects of the present invention as recited in the claims, are neither disclosed nor suggested by any of the cited references.

In view of the foregoing amendments and remarks, Applicant respectfully submits that the cited references do not disclose or make obvious the claimed invention. Accordingly,

reconsideration of the rejection is respectfully requested with a passage of this application to allowance respectfully solicited. The Examiner is invited to telephone the undersigned attorney if there are any questions about this submission or other matters, which may be addressed in that fashion.

Respectfully submitted,

By: _____

Scott J. Stevens, Reg. No. 29,446
Woodard, Emhardt, Moriarty,
McNett & Henry LLP
3700 Bank One Center/Tower
111 Monument Circle
Indianapolis, IN 46204-5137
(317) 634-3456